REMARKS

Claims 1-31 are pending in this application. Reconsideration and allowance are respectfully requested.

The Examiner objected to the disclosure, in particular to paragraphs [0001], [0035], [0038], and [0039]. The objected-to portions of the specification have now been deleted or amended, which Applicants submit make these objections moot. Claims 14 and 25 stand rejected under 35 USC 112, second paragraph, as being indefinite. The claims have been amended, which Applicants submit make these objections moot.

LIST OF REJECTIONS

Claims 1-7, 12-18, and 23-27 stand rejected as being anticipated or obvious over EP 1138733, and claims 4, 8-11, 17, and 19-22 stand rejected as being obvious over EP 1138733 in view of co-assigned Small's '039 or '024 patents. The Examiner notes EP 1138733 teaches a polishing composition comprising water, polymeric abrasives, and an oxidizing agent. The Examiner's position is because the particles in EP 1138733 are dispersed (not agglomerated) and have the same sign (zeta potential), that the claimed repulsive force is inherent. For the same reasons, claims 1-7, 9, 12-18, and 23-27 stand rejected as being anticipated or obvious over EP 1036836, and claims 8, 10-11, 19, and 21-22 stand rejected as being obvious over EP 1138733 in view of co-assigned Small's '039 or '024 patents. Also for the same reasons, claims 1-7, 12-18, and 23-27 stand rejected as being anticipated or obvious over Motonari et al., and claims 4, 8-11, 17, and 19-22 stand rejected as being obvious over Motonari et al. in view of co-assigned Small's '039 or '024 patents. Also for the same reasons, claims 1-7, 9, 14-18, 20, and 25-27 stand rejected as being anticipated or obvious over Yano et al., and claims 8, 10-13, 19, and 21-24 stand rejected as being obvious over Yano et al. in view of co-assigned Small's '039 or '024 patents.

The Examiner also rejects claims 1-9, 12-20, and 23-27 as being anticipated or obvious over co-assigned Small's '024 patent, and rejects claims 4, 10-11, 17, and 21-22 as being anticipated or obvious over co-assigned Small's '039 patent.

Claims 1-7, 12-18, and 23-31 stand rejected as being anticipated or obvious over published application 2003/0079416 (Ma et al.), and claims 4, 8-11, 17, and 19-22 stand rejected as being obvious over Ma et al. in view of co-assigned Small's '039 or '024 patents. The Examiner notes Ma et al. teaches abrasives can be coated with a surfactant prior to being

incorporated into a slurry, and the surfactant imparts surface charges that result in steric repulsion of particles.

The Examiner has accurately described the disclosures and teachings of the cited prior art. Nevertheless, with respect to the claims 28-31 and with respect to claims 1-27 as amended, Applicants respectfully traverse.

ARGUMENT WITH RESPECT TO CLAIMS 28-31

The Applicants use of the term "imparting an electrostatic charge" in independent claims 28 and 29 means the particles have an externally imposed electrical charge. This externally imposed electrical charge is independent of the electrical charge imparted on a particle by disassociation of polar groups on the surface of the particle. Paragraph 16 teaches electrically charging dry particles by friction electrification. The specification states the externally imposed electrical charge can be put on a dry particle, which is definitive evidence that this charge is not related to ionization of polar groups on the surface of the particle. Paragraph 34 teaches a variety of methods by which a particle can be charged – but several require "the polar groups in the polymer and the insulative nature of the polymeric particles, which generally have a resistivity of above about 10^{14} ohms." The insulative nature of the particles has no relevance whatever to charges imparted by ionized polar groups, but the presence of (non-disassociated) polar groups is extremely important generating a static charge by passing the particle through an electric field (as is also taught in paragraph 34), and also in maintaining the static charge when the polymeric particle is in contact with water.

This requirement for an externally imposed electrical charge is clear in the claim limitations, because particles must be charged prior to adding the particles to an aqueous solution. *See*, e.g., original claim 28:

"A method of preparing a composition for CMP, comprising:

providing an aqueous solution;

imparting an electrostatic charge to polymeric particles, the electrical charge sufficient to create an electrostatic repulsive force between proximate particles;

and adding an abrasive comprising the electrostatically charged polymeric particles to the aqueous solution." (*emphasis added*)

While generally clauses in claims can be read in any order, this is not the case if a clause has a condition-precedent. Claim 28 can not be said to claim adding particles to the water wherein an

electric charge subsequently results from interaction of the polar groups in the polymer with the water, because the plain language of the claim requires that particles must have an electric charge prior to "adding an abrasive comprising the electrostatically charged particles to the water." The Examiner is clearly aware of this nuance, as the only reference cited by the Examiner against claims 28 and 29 was Ma et al. (where a surfactant was added to the polymeric abrasives prior to adding the abrasives to the slurry).

Applicants used the term "electrical charge" to mean an externally imposed electrical charge, separate and apart from any charge resulting from disassociation of polar groups that naturally occurs when a polymer containing polar groups is placed in water. *See*, e.g., Paragraph 16 of the instant specification teaches "in this dry formulation, the polymer particles are easily charged via friction electrification to obtain the desired positive or negative charge." Paragraph 16 then states "Additionally, in this form, the surfaces of the individual particles are easily modified ... to produce ... a desirable ionic content or zeta potential." (*emphasis added*) This suggests (correctly) that the zeta potential is in part related to the disassociation of polar groups in the polymer, but the act of charging the particle is separate and distinct from surface modifications to alter the zeta potential.

Therefore, when the Applicants claim "imparting an electrostatic charge to polymeric particles", Applicants mean imparting an electric charge on a particle which is separate and distinct from charges that result naturally by disassociation of polar groups on the particle surface that occurs on the particle contacting water. This is clearly present in claim 28 – only after particles are charged are they added to an aqueous solution. Disassociable polar groups disassociate, and obtain an electric charge, only on contact with water. All of the art cited by the Examiner - EP 1138733, EP 1036836, Motonari et al., Yano et al., the co-assigned Small patents, and even Ma et al. - discloses only electric charges generated by interaction of polar groups with water. Such particles are not charged UNTIL they contact water - whether the polar groups are in the polymers making up the particle, whether the polar groups are present in surfactants adhering to the particle surface, or both.

Claim 28 was rejected in view of Ma et al. The Examiner's reading of Ma et al. is accurate, but the Examiner has failed to appreciate the fine distinction between the claim language and the teaching of Ma et al. Claim 28 requires imparting an electrical (electrostatic) charge to the particle itself, and adding the charged particles to an aqueous solution. Ma et al.

teach adhering a surfactant molecules carrying one or more polar groups to the exterior of particles, where these surfactant molecules by their interaction of the polar groups with water (disassociation) generate a repulsive electric charge. There are two reasons Ma et al. fail to invalidate claim 28: First, Ma et al. teach loosely attaching charged molecules to the surface of the particle, which is NOT imparting a charge to the polymer particle; and Second, Ma et al. teach attaching charged molecules to the surface of the particle before adding the particles to the slurry – but the particles of Ma et al are in an aqueous solution when the surfactants are added to the particles. The slurry of particles with surfactants is then added to the CMP slurry, where the CMP slurry has a number of other components which would otherwise make particles agglomerate. Polar groups in general, and in the case of Ma et al., polar groups on surfactants, do not generate any charge until they contact water. Polar groups are "chargable" when dry and become charged on exposure to water. Claim 28 requires adding charged (not "chargable") particles to an aqueous solution (water).

For this reason, claims 28 is believed to be patentable over the cited art. Claim 29 has identical clauses as does claim 28, and the arguments given for claim 29 are therefore equally applicable to claim 29. Claims 30 and 31 depend on claims 28 or 29. Applicants respectfully request reconsideration and removal of the rejections to claims 28-31.

AMENDMENTS TO INDEPENDENT CLAIM 1

The same distinction (and reason for patentability) described in detail with respect to claim 28 is also applicable to the remaining claims 1-27. Applicants intended the use of the term "having an electrical charge sufficient to create electrostatic repulsive force" in independent claims 1 and 15 to mean the same thing as "imparting an electrostatic charge" in independent claims 28 and 29. That is, the particles have an externally imposed electrical charge which is independent of the electrical charge imparted on a particle by disassociation of polar groups on the surface of the particle. However, the Examiner's broader interpretation of these claims is reasonable, and therefore Applicants have amended claims 1 and 15 to make this distinction more explicit.

Independent claim 1 has been amended to recite the phrase wherein the polymeric particles would in a dried state have an electric charge. Applicants disclosed a variety of methods of imparting an electric charge to dry particles.

Claim 1 also includes the added language wherein the polymeric particles in the aqueous solution have an electrical charge sufficient to create an electrostatic repulsive force between proximate particles. The zeta potential therefore measures both the "normal" charges due to ionization of polar groups and also the externally imposed electrostatic charge (if any). It is well known in the art that the zeta potential (a measurement of repulsive force) is derived from the movement of a particle in response to an imposed electric field, and therefore the zeta potential is a function of the total electrical charge contained on a particle. This would include any externally added electric charge plus any electric charge resulting from placing the particle having disassociable polar groups on the surface thereof in contact with water. The prior art only had the electrical charge imposed by placing polymers having disassociable polar groups in contact with water, where the electrical charge was the natural charge resulting from the disassociation (or ionization) of polar groups on the surface of the particle. The amendments to claim 1 should make it abundantly clear that what Applicants claim is particles that have an externally imposed electric charge, in addition to any charges which may result from disassociation of polar groups on the surface of the particle, where the TOTAL CHARGE results in an electrostatic repulsive force (a stable zeta potential). The electrical charge can for example supplement weak charges imparted by ionization of only a small number of disassociable polar groups that is otherwise insufficient to generate sufficient repulsive force.

Claim 1 as amended is believed to be patentable over the cited art. All of the art cited by the Examiner - EP 1138733, EP 1036836, Motonari et al., Yano et al., the co-assigned Small patents, and even Ma et al. - discloses only electric charges generated by interaction of polar groups with water. Such particles are not charged UNTIL they contact water - whether the polar groups are in the polymers making up the particle, whether the polar groups are present in surfactants adhering to the particle surface, or both. While the Examiner is quite correct that if a slurry made according to the cited art (EP 1138733, EP 1138733, EP 1036836, Motonari et al., Yano et al., the co-assigned Small patents, Ma et al., or any combination thereof) is stable it can be presumed to have sufficient electrical charges to repulse adjacent particles, the electrical charges in the cited art are only charges resulting from the ionization of polar groups within or on the particle. The polymeric particles in the prior art have no charge when dry. The cited art does not teach or suggest adding an externally imposed electrostatic charge to particles such that the particles when dry would have the electrical charge.

AMENDMENTS TO INDEPENDENT CLAIM 15

Independent claim 15 was amended to recite wherein the polymer particles are electrified and the polymer particles in said aqueous solution ~~have~~ having an electrical charge sufficient to create an electrostatic repulsive force between adjacent particles. Support for this language can be found in the last line of paragraph 0014. The specification teaches that particles can be charged (electrified) by passing through an electrostatic field or via contact electrification. This externally imposed charge is not related to electrostatic charges arising from ionization of polar groups on the particle surface. The reasons for patentability of independent claim 15, as amended, were put forth in the arguments pertaining to claims 28 and 1 presented above, which are incorporated here by reference thereto.

NEW CLAIMS 32-34

New claim 32, depending from independent claim 15, recites that the particle can be electrified by virtue of passing through an electricstatic field, by friction electrification, or by contact with an electrified surface. The specification teaches in paragraph 0034 that polymer particles may become charged "by friction electrification", by "being passed through an electrostatic field", or by "contact electrification".

New claim 33, depending from independent claim 15, recites the polymer particles have a water content of about 2% or less. The particles are polymerized without surfactants to obtain a water content of less than 2% as described in paragraph 36. The resulting particles can then be charged, and will also have a high resistivity necessary to maintain the charge when the particle is in contact with electrically conductive water.

New claim 34 recites that the electrical charge is of the same net sign as the charge imparted to the particle by disassociation of polar groups in the particle. The imposed electrical charge can, as is taught in paragraph 16, be either a positive or a negative charge. The specification notes in paragraph 45, and it is generally known by one of ordinary skill in the art, that if the zeta potential is near zero, particles agglomerate. Paragraph 30 teaches that "the polymeric particles ... are capable of carrying an electrical charge" and "the polymeric particles are charged in such a way as to reduce or minimize the formation of ... undesirable aggregates." To make particles repulse one another more than natural repulsion due to charges resulting from ionization of polar groups on the surface of the particles, the externally imposed charge must be

of the same sign as the overall charge due to the ionization of polar groups in the particles when the particles are in the aqueous solution.

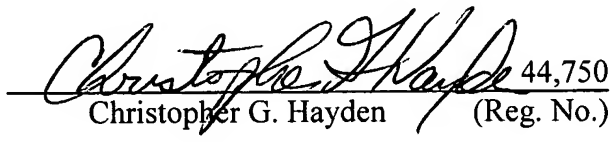
CONCLUSION

The claims have been amended in a manner believed to place the application in condition for allowance, and it is also believed the amendments overcome the Examiner's objections and rejections. As no new matter has been added, reconsideration and allowance is respectfully requested.

No fee is believed necessary relating to this response – however, if any additional fees are deemed necessary for any reason, the Office is authorized to charge them to Morgan, Lewis & Bockius LLP Deposit Account No. 50-0310.

Respectfully submitted,

Date April 28, 2005



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